

THE APPLICATION OF THE NAME *TEMPLETONIA SULCATA*
(Meissn.) Benth. AND A NEW SPECIES OF *TEMPLETONIA* R.Br.
(PAPILIONACEAE) FROM WESTERN AUSTRALIA

by

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ABSTRACT

The correct application of the name *Templetonia sulcata* (Meissn.) Benth. is established and *T. smithiana* sp. nov. is described from Western Australia.

INTRODUCTION

The existence of two closely related taxa among the plants traditionally referred to *T. sulcata* in Western Australia and the resulting uncertainty concerning the correct application of the name *T. sulcata* were discussed previously (Ross, 1982). Subsequent field studies have clarified this situation.

THE APPLICATION OF THE NAME *T. SULCATA*

The two taxa in Western Australia traditionally referred to *T. sulcata* differ in pod size and in seed size, shape and colour; the taxon with large pods having pods 2-2.8 cm long and 0.95-1.5 cm wide and the taxon with small pods having pods 0.75-1.8 cm long and 0.4-0.8 cm wide. When the earlier work was undertaken (Ross, l.c.) the two taxa could not be distinguished with confidence in the absence of mature pods, despite the presence of other differential tendencies, and the uncertainty over the correct application of the name *T. sulcata* arose because Preiss 1028, the type of *T. sulcata*, is a flowering specimen with immature pods. The small-podded and large-podded taxa occur sympatrically in some areas and the type locality of *T. sulcata* near York is within the area where both taxa might be expected to occur.

In response to a request for assistance, Basil and Mary Smith of Wongan Hills spent a considerable amount of time and effort in the field collecting, recording and observing populations of *T. sulcata*. Plants were tagged, sprayed with insecticide to ensure that developing pods reached maturity, and revisited. It was thought unlikely that *T. sulcata* had survived in the vicinity of York as the Avon River valley has been farmed intensively for over a century but aerial reconnaissance by Basil Smith identified several possible habitats. Subsequent visits to these areas by road revealed good populations at Mt. Hardy east of York and between the Avon and Dale rivers near Dale Bridge south of York. This paper is based on the Smith's efforts supplemented by my own field studies and the examination of herbarium collections.

Observations in the Lake Moore, Manmanning, Cowcowing, Southern Cross and York areas confirmed that the two taxa can be differentiated readily by pod size and by seed size and shape. Plants either have large pods containing large seeds (10-16 mm long, 6-9 mm wide) or small pods containing small seeds (4-5.5 mm long, 2.2-3 mm wide). Furthermore, large pods occur on large plants (mostly 1.7-3.2 m high) and small pods on small plants which seldom exceed 1.8 m in height. There is no discontinuity in the size of the large-podded and small-podded plants and, of course, when young, the large-podded plants are small. Although large- and small-podded plants occur sympatrically, they tend to have slightly different ecological preferences and in no instance were mixed populations of large- and small-podded plants observed. The large-podded plants favour sandy loam rises near salt lakes and the small-podded plants favour clay or sandy soils and

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usually occur with *Eucalyptus salmonophloia*. The small-podded plants are usually more intricately branched and denser than the large-podded plants. In the field the habit and stature of the plants enable the two taxa to be recognized with little difficulty and provide a fairly reliable means of predicting pod size.

As a result of field observations and the re-examination of type material and other herbarium collections, I am satisfied that the name *T. sulcata* applies to the taxon with small pods which is widespread in southern Western Australia, and occurs also in South Australia, Victoria and New South Wales. The representative specimens of the taxon with small pods cited in Ross, l.c.:28 are referable to *T. sulcata*. *Bossiaea rossii* F. Muell., *Fragm. Phyt. Austr.* 3:94 (1862), discussed and lectotypified in Ross, l.c. 27-28, is a synonym of *T. sulcata*.

In an endeavour to obtain supplementary evidence in support of the decision concerning the application of the name *T. sulcata* I took up an offer by Dr. F. G. Lennox, C/- School of Botany, University of Melbourne, to study the polyphenols in stem extracts by means of thin-layer chromatography. A stem sample 1.5 cm long was taken from nine different specimens, the specimens representing contemporary material of the small-podded and the large-podded taxa and the two type sheets of *T. sulcata* in MEL. The nine samples were submitted to Dr. Lennox who employed the method to extract the polyphenols from the stem samples outlined in Calder et al. (1982). The polyphenol samples were developed in one dimension with 15% acetic acid using "Merck TLC aluminium sheet cellulose F₂₅₄" as the support medium.

The fluorescent patterns obtained from the polyphenols divided the nine samples into two groups, one group corresponding to the samples from the specimens with small pods and the other to the samples from the specimens with large pods. The patterns exhibited by the two samples from the type material of *T. sulcata* matched the patterns shown by the samples of the small-podded taxon.

T. sulcata and the taxon with large pods are unquestionably closely allied and their differentiation in the absence of mature pods is difficult on occasions. However, the latter merits formal taxonomic recognition and, because the seeds are significantly different, specific rank seems appropriate. It affords me much pleasure to name this species *T. smithiana* in honour of Basil and Mary Smith.

T. SMITHIANA

Templetonia smithiana J. H. Ross, sp. nov., *T. sulcatae* (Meissn.) Benth. affinis, a qua leguminibus majoribus et seminibus majoribus ellipticis brunneis et ochro-brunneis differt.

Frutex usque ad 3.2 m altus, aphyllus, glaber; rami complanati, 3.5-9 mm lati, longitudinaliter striati, apicibus acutiusculi vel saepe spinescentes. Stipulae inconspicuae. Flores axillares, solitarii vel gemini; pedicelli usque ad 2 mm longi; bracteolae 1.5-2 mm longae, 1.6-2 mm latae, persistentes. Calyx usque ad 4.3 mm longus. Vexillum oblatum, 5.5-7.5 mm longum, 5.5-7 mm latum, flavescens et atro-purpurascens; alae usque ad 6.5 mm longae et 2.6 mm latae, unguiculatae; carina usque ad 6 mm longa, unguiculata. Stamina 10; filamenta in columnam antice fissam connata. Ovarium glabrum. Legumina oblique obovata vel elliptica, 2-2.8 cm longa, 0.95-1.5 cm lata, coriacea, extus nigro-fusca, compressa sed non complanata. Semina elliptica, complanata, 10-16 mm longa, 6-9 mm lata, brunnea vel ochro-brunnea.

Glabrous leafless *shrub* to 3.2 m high with divaricate flattened branches, the *branches* 3.5-9 mm wide, faintly or distinctly longitudinally striate, the margins notched at the nodes, often terminating in a short spine. *Stipules* inconspicuous. *Leaves* reduced to minute scales up to 1 mm long. *Flowers* 1 or 2 per axil, on glabrous pedicels up to 2 mm long, the pedicels with a pair of ovate papery brown bracteoles 1.5-2 x 1.6-2 mm which overlap the base of the calyx, the bracteoles convex outside, concave within, glabrous or with marginal cilia. *Calyx* up to 4.3 mm long, the lowest lobe often slightly longer than the others, the lobes mostly shorter than the tube, glabrous outside except for hairs on the apices of the lobes. *Standard* oblate, 5.5-7.5 mm long including a claw up to 1.5 mm long, 5.5-7 mm wide, emarginate apically, yellow and purplish-brown; *wings* up to 6.5 mm long including a claw up to 2 mm long, up to 2.6 mm wide, auricled; *keel* petals

up to 6 mm long including a claw up to 2 mm long, up to 2.5 mm wide, auricled. *Stamens* up to 6.5 mm long. *Ovary* shortly stipitate, mostly 4-6-ovulate, glabrous. *Pods* obliquely obovate or elliptic, narrowed to an acute lateral apical beak, 2-2.8 cm long, 0.95-1.5 cm wide, 0.4-0.8 cm thick, shortly stipitate, 1(2)-seeded, valves coriaceous, convex, dark brown, glabrous. *Seeds* elliptic, flattened, 10-16 mm long, 6-9 mm wide, 3-4.5 mm thick, pale brown or yellowish-brown, the hilum surrounded by a collar-like aril.

TYPE COLLECTION: Western Australia, Doodarding, No. 2 Rabbit fence, 0.25 mile N. of gate 44, 31° 01' S., 117° 12' E., 13.xii.1982, *B. H. Smith* 204 (MEL 626707 holo., isotypes to be distributed to K, PERTH).

REPRESENTATIVE SPECIMENS EXAMINED:

Western Australia — between Champion and Shark Bay, *F. Mueller* (MEL 565877). Upper Irwin River, xi.1877, *F. Mueller* (MEL 92108). 11.2 km E. of Winchester, 25.xi.1972, *C. Chapman* (PERTH). Mt. Caroline, Upper Swan River, 1886, *G. A. Sewell* (MEL 92107). Near Mt. Collier, 26.iv.1980, *B. H. Smith* (MEL 569227). Lake Moore, 12.xii.1980, *B. H. Smith* (MEL 580090). Koombarkine, 13.xii.1980, *B. H. Smith* (MEL 580089). Cullimbin Reserve, 16 km E. of Manmanning, 4.ix.1982, *J. H. Ross* 2768 (MEL 626717). Cowcowing Cemetery, 29.5 km N. of Wyalkatchem on road to Koorda, 4.ix.1982, *J. H. Ross* 2769 (MEL 626718). 4.8 km NW of Nalkain, 1.xii.1981, *B. H. Smith* (MEL 602327). Hines Hill, 6.xii.1961, *R. D. Royce* 6773 (PERTH). 19.8 miles N. of Vermin Fence on road from Eenuin to Mt. Jackson, 22.xi.1981, *B. H. Smith* (MEL 602329). Great Eastern Highway, near old Southern Cross cemetery, 19.ix.1963, *J. H. Willis* (MEL 566295). Duladgin Rock, 3.ix.1981, *B. H. Smith* (MEL 602326).

T. smithiana is endemic in Western Australia and occurs mainly from south-east of Geraldton to approximately the Great Southern Highway from Perth to York and eastwards to Coolgardie (Fig. 1). It favours sandy loam rises near salt lakes.

The pods and seeds differentiate *T. sulcata* and *T. smithiana* readily (see Ross, l.c.:26, fig. 15). The diagnostic differences are given in Table 1.

It is unfortunate that no reliable floral character has been found to differentiate flowering material of *T. sulcata* and *T. smithiana* but differences in habit and stature and, to some extent ecological preferences, will assist to distinguish the two species. There is a suggestion that flower colour of the two species differs slightly, the flowers of *T. sulcata* being more conspicuously yellow than those of *T. smithiana* which tend to be duller and less obvious. In *T. sulcata* the calyx lobes tend to be acute apically and the ovaries usually contain 2-4 ovules whereas in *T. smithiana* the calyx lobes tend to be obtuse apically and the ovaries 4-6 ovulate.

The occurrence of two closely related leafless species with flattened stems is reminiscent of the relationship that exists between *T. egena* (F. Muell.) Benth. and *T. battii* F. Muell., two leafless species with terete stems.

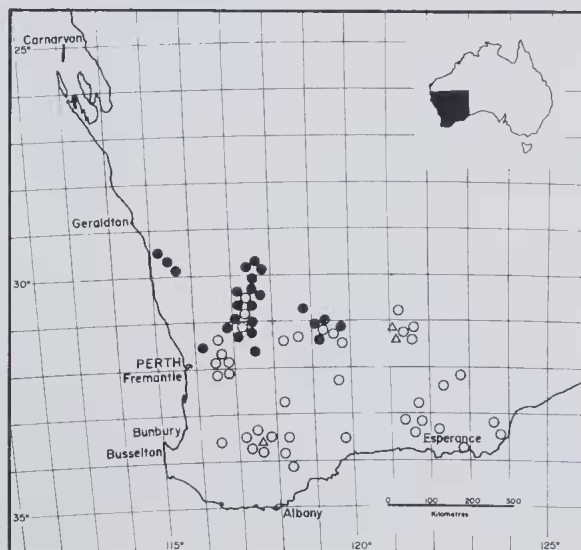


Fig. 1. The known distributions of *Templetonia sulcata* and *T. smithiana* in Western Australia.

○ — *T. sulcata*;
● — *T. smithiana*;
△ — sterile or flowering specimens which cannot be referred to either *T. sulcata* or *T. smithiana* with certainty.

Table 1. Comparison of the diagnostic differences between *T. sulcata* and *T. smithiana*.

	<i>T. sulcata</i>	<i>T. smithiana</i>
pod length	7.5-18 mm	20-28 mm
pod width	4-8 mm	9.5-15 mm
seed length	4-5.5 mm	10-16 mm
seed width	2.2-3 mm	6-9 mm
seed shape	oblong	elliptic
seed colour	deep olive brown	brown or yellowish-brown
aril	conspicuous, margin incised and frilly	less conspicuous than in <i>T. sulcata</i> and margin not frilly

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REFERENCES

- Calder, D. M., Lennox, F. G. & Bernhardt, P. (1982). Natural hybridization between *Amyema pendulum* and *Amyema quandang*, Loranthaceae. *Aust.J.Bot.* 30:625-633.
- Ross, J. H. (1982). A revision of the genus *Templetonia* R.Br. (Papilionaceae). *Muelleria* 5:1-29.